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Improving Mathematics Learning Outcomes On Integer Materials Through Think Pair And Share Learning Models

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Abstract. This study aims to: (1) determine the extent to which the Think Pair and Share learning model can improve Mathematics learning outcomes about integers in grade IV students of Nasem Merauke Elementary School, (2) improve mastery of Mathematics learning materials for grade IV students of Nasem Merauke Elementary School, so that student learning outcomes can improve, and (3) reflect on oneself for the sake of improving teacher abilities. This study employed a quantitative approach. This study indicated that fourth-grade students at Inpres Nasem Merauke Elementary School show improved understanding of integers subsequent to the application of the Think Pair and Share instructional style. The proportion of students achieving the learning completion in each cycle, from 17 students (68.00%) in cycle I to 22 students (88.00%) in cycle II, signifying a beneficial impact. The proportion of students who failed to fulfill the prerequisites fell from 8 (32.0%) in cycle I to 3 (12.00%) in cycle II. The Think Pair and Share learning model benefits students by fostering creativity, sustaining their interest in the content, and mitigating the effects of boredom on their learning experience.

Keywords: Think pair, share, Integer, Elementary school.

I. INTRODUCTION

Education is crucial for the survival and prosperity of a country and its populace, as well as for enhancing the quality of its human resources. The intricacy of modern existence is increasingly apparent, characterized by the rise of obstacles and varied expectations across multiple domains. Individuals must attain proficiency in diverse competencies and skills (Sabaruddin, 2022). The establishment of a quality society relies on education, particularly in preparing students to fulfill positions that showcase their strengths, creativity, autonomy, and professional accomplishments across diverse domains. The learning process is among the techniques and approaches necessary for achieving educational objectives (Mahrus, 2021). When students and educators collaborate in the classroom, they engage in the learning process. Educators encounter challenges in enhancing educational quality due to the issues. Reforms in educational institutions, curricula, teaching methodologies, and physical learning environments significantly influence student development throughout all facets of life (Siregar, 2021).

The ability of teachers to discern models that align with aims and subjects is crucial for enhancing students' learning motivation. This criterion must be fulfilled by educators

throughout the instructional process, particularly in mathematics education. Mathematics education is essential for fostering intellectual development and professional achievement among mathematics educators. The pivotal role of mathematics teachers in realizing these objectives is significant, particularly in enhancing mathematical proficiency within mathematics education (Ellianawati et al., 2024). This aligns with the present curriculum requirements, which provide instructors considerable flexibility in selecting their pedagogical methods. Mathematics is a fundamental discipline in the advancement of science, holding a significant role in all facets of life (Nugraheni & Marsigit, 2021), as seen by the greater allocation of instructional hours compared to other subjects. In the study of mathematics, a student will encounter the notion of counting and is anticipated to use it in daily life (Siregar, 2021).

Instructing young learners in problem-solving skills is crucial to the mathematics curriculum (Mulyati, 2016). The young learners in question are elementary school kids aged 6 to 12 years. The developmental objectives for primary school kids include acquiring knowledge, social interaction,

forming friendships with peers, and collaborating in groups. Elementary school pupils must attain these developmental phases to facilitate the smooth progression of succeeding stages, hence preventing maladaptive social development. Educational institutions anticipate that mathematics educators will guarantee pupils comprehend all mathematical content and attain favorable learning results (Novelita & Darmansyah, 2022). Differentiated instruction is advocated to enhance student learning results. This technique addresses the necessity for a learning methodology customized to the requirements and development of each student. Cooperative learning is an effective instructional approach that can engage students. Numerous modalities of cooperative learning exist, one of which is the Think Pair Share method. The Think Pair Share model is a fundamental cooperative learning tool, particularly appropriate for beginning educators employing collaborative techniques (Marta, 2017).

Researchers noted that numerous fourth-grade students at Inpres Nasem Elementary School struggled to comprehend Mathematics lessons on fractions when instructed via lectures and chalkboard illustrations pertaining to daily activities prior to attending school. During the introduction activities, the lecturer elucidated the content as the students listened with rapt attention. The instructor facilitated a question-and-answer session, during which certain pupils refrained from posing inquiries. During the concluding

exercise, the instructor administered an assessment to gauge student proficiency, with a maximum score of 60, a minimum score of 20, and an average score of 38.4. The outcomes of fourth-grade mathematical education remain significantly suboptimal. The description indicates that the classroom learning process does not align with the teacher's expectations.

II. METHODS

Research Type

This study assessed the mathematics knowledge of fourth-grade students at Inpres Nasem Merauke Elementary School by quantitative approaches (Amreta & Safa'ah, 2021).

Research Location and Time

This research was conducted in March of the second semester of this year and comprised three cycles. The investigation was conducted at Inpres Nasem Elementary School, located in Nasem Village, Merauke District, Merauke Regency, Papua Province.

Research Subject

Fourth-grade students at Inpres Nasem Elementary School in Nasem Village, Merauke Regency, engaged in this classroom action research. Eleven boys and nine girls are enrolled in the fourth grade.

Table 1. Data of Grade IV Students of Inpres Nasem Elementary School

No.	NIS	NISN	Name	Gender
1.	216	0048713757	X1	L
2.	159	0019191884	X2	L
3.	241	0058230574	X3	L
4.	217	0047269640	X4	L
5.	243	0057947030	X5	P
6.	249	0044003124	X6	L
7.	318	0054009997	X7	L
8.	311	0047195542	X8	L
9.	252	0046747877	X9	P
10.	313	0011528058	X10	P
11.	236	0026001896	X11	L
12.	314	0038220194	X12	L
13.	224	0058104930	X13	P
14.	191	0026900842	X14	P
15.	219	0052362304	X15	P
16.	164	0024341678	X16	P
17.	261	0068737371	X17	L
18.	312	0054170949	X18	L
19.	237	0051260979	X19	P
20.	290	0026761531	X20	L
21.	225	0036045061	X21	L
22.	260	0063302415	X22	L
23.	265	0048294140	X23	L
24.	235	0044879015	X24	P

25.	221	0049175549	X25	L
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Cycle Description

1. Pre-Cycle Description

During this pre-cycle, the researcher will investigate mathematics learning concerning the notion of integers, emphasizing the fundamental competency of ordering integers in fourth grade at Inpres Nasem Merauke

Elementary School. During this cycle, the instructor continues to employ the lecture style for instruction. The effectiveness of learning in this pre-cycle will be evaluated using research indicators, especially student academic achievement as indicated by exam scores with KKM 60.

Table 2. Pre-Cycle Score

No.	Name	Categorization	Score
1.	X1	Surpassed	60
2.	X2	Not Surpassed	20
3.	X3	Surpassed	40
4.	X4	Surpassed	40
5.	X5	Surpassed	60
6.	X6	Not Surpassed	40
7.	X7	Not Surpassed	-
8.	X8	Not Surpassed	40
9.	X9	Surpassed	60
10.	X10	Not Surpassed	-
11.	X11	Surpassed	60
12.	X12	Not Surpassed	40
13.	X13	Surpassed	60
14.	X14	Surpassed	60
15.	X15	Not Surpassed	-
16.	X16	Not Surpassed	40
17.	X17	Not Surpassed	20
18.	X18	Surpassed	60
19.	X19	Surpassed	60
20.	X20	Not Surpassed	-
21.	X21	Not Surpassed	40
22.	X22	Surpassed	60
23.	X23	Surpassed	60
24.	X24	Not Surpassed	-
25.	X25	Not Surpassed	20
Total			960
Average			38.04
Percentage on the Surpassed Students			44.00%

The table above indicates that 11 students (44.00%) out of 25 did not complete the course, while 14 students (56.00%) failed to complete it entirely. There is a necessity to enhance mathematics education in anticipation of the forthcoming unit, which will focus on the addition of numbers.

2. Description of Cycle I

a. Learning Plan

1) The teacher poses questions pertaining to the forthcoming lesson.

- 2) When the instructor presents a problem, the class can engage in brainstorming potential solutions.
- 3) Teacher established three groups. Each group comprises eight students, whereas one group consists of nine students.
- 4) Each student is provided with a worksheet by the teacher.
- 5) Following the discussion of their reflections in small groups, students document their thoughts and emotions.

6) The teacher steers the discussion towards subjects or matters that students have not articulated during the chat.

b. Implementation

The author instructs on the addition of integers in the fourth grade at Inpres Nasem Elementary School, focusing on the ability to add both positive and negative integers. Additionally, learning objectives are conveyed and interpretations are utilized in accordance with the subject matter throughout the teaching and learning process.

c. Observation

Colleagues oversee all classroom and student activities, documenting each student's outcomes and advancement. The subsequent findings derive from the data analysis.

- 1) There is coherence between the application of concepts and the course content.
- 2) Each phase of the learning process aligns with the selected learning model.
- 3) While the learning paradigm is broadly recognized, certain students may remain disengaged due to the prevalent use of excessive grouping.

Table 3. Learning Management in Cycle I

No.	Observed Aspects	Score
Observation of Teaching and Learning Activities		
A. Introduction		
	Inspire Students	2
	Convey Objectives	3
	Integrate Prior Knowledge	3
B. Core activities		
1.	Presenting Think Pair and Share Steps	3
	Providing Instructions to Students in the Activity	3
	Developing Discussion Skills	3
	Providing Support to Students	3
C. Closing		
	Giving conclusion	3
	Giving evaluation	3
2.	Time Management	2
Class Enthusiasm		
3.	Student Enthusiasm	3
	Teacher Enthusiasm	4

d. Evaluation

The researcher conducts a thorough examination of the learning process, evaluates assessment data, and examines improvement strategies. Should the execution of the initial cycle prove ineffective, the teacher-researcher may leverage the insights obtained from this reflection to devise and establish a strategic plan for the subsequent cycle. Information regarding the execution of these educational activities is derived from observational study findings.

- 1) The teacher has not offered adequate support to students in creating summaries.
- 2) The teacher has deficiencies in time management.
- 3) The teacher fails to furnish sufficient instances of questions, resulting in students' incomplete comprehension of the content.

Deficiencies persisted in the execution of teaching and learning activities during Cycle I, necessitating adjustments in the subsequent cycle.

- 1) Teachers must assist students in crafting summaries to enhance their comprehension of the subject content.

- 2) Teachers must allocate time effectively in accordance with the design.
- 3) Teachers must furnish numerous examples of inquiries while elucidating the content.

3. Description of Cycle II

a. Learning Plan

- 1) The teacher poses questions pertaining to the forthcoming lesson.
- 2) When the instructor presents a problem, the class can engage in brainstorming potential solutions.
- 3) Teacher established three groups. Each group comprises eight students, whereas one group consists of nine students.
- 4) Each student is provided with a worksheet by the teacher.
- 5) Following the discussion of their reflections in small groups, students document their thoughts and emotions.

6) The teacher steers the discussion towards subjects or matters that students have not articulated during the chat.

b. Implementation

The researcher instructed on integers in grade IV at Inpres Nasem Merauke Elementary School, with the objective of enabling students to subtract positive and negative numbers. The researcher defined the learning objectives, clarified perspectives on the issue, and thereafter documented the learning themes.

c. Observation

- 1) The application of concepts aligns with the educational material.
- 2) The procedures align with the employed learning methodologies.
- 3) Student learning results are optimal as they have attained the KKM value in the mathematics division arithmetic operation course.

Table 4. Learning Management in Cycle II

No.	Observed Aspects	Score
Observation of Teaching and Learning Activities		
A. Introduction		
	Inspire Students	4
	Convey Objectives	4
	Integrate Prior Knowledge	3
B. Core activities		
1.	Presenting Think Pair and Share Steps	4
	Providing Instructions to Students in the Activity	3
	Developing Discussion Skills	4
	Providing Support to Students	3
C. Closing		
	Giving conclusion	4
	Giving evaluation	4
2.	Time Management	3
Class Enthusiasm		
3.	Student Enthusiasm	4
	Teacher Enthusiasm	4

d. Evaluation

The percentage of student learning completion rose to 88.00% from the initial RPP result of 68.00%. The account of the execution of learning enhancement actions over the two cycles indicates advancement in a positive direction. Concerning educators, students, and learning devices, to guarantee that the attained accomplishments are satisfactory.

Data Analysis Technique

Descriptive analysis of learning result data is employed to delineate each cycle aimed at enhancing maths proficiency in integers. Calculating the average completion value provides insights into pupils' cognitive capacities in responding to questions.

1. Calculating the Average

The formula below is used to calculate the student's average score.

$$x = \frac{\sum x}{N}$$

Description:

Σx = Total score

N = Number of students

2. Calculating Learning Completion

a. Individual Learning Completion

Data derived from student learning outcomes facilitates the achievement of personal educational objectives. Students are deemed to have completed the course if they achieve a score of 60 or higher, and not completed if their score is below 59. This aligns with the KKM standard for Mathematics in the second semester.

b. Classical Learning Completion

Data derived from learning outcomes can facilitate the fulfillment of traditional learning via descriptive percentage analysis employing the subsequent formula.

$$\frac{\text{Number of surpassed students}}{\text{Number of all students}} \times 100\%$$

The data collected from the pre-cycle to cycle II were analyzed, assessed, and displayed in tabular format, accompanied by the author's reflection. Upon analysis and

reflection, the author assessed the merits and drawbacks of the learning process and devised an action plan for the subsequent learning cycle.

III. FINDINGS AND DISCUSSION

1. Class Situation

Observations conducted throughout the learning process yielded several conclusions, including the following.

- a. Students have not attained the KKM requirement of 60% learning completion. Eleven of twenty-five students have fulfilled all requisite courses.
- b. Research indicates that the lecture teaching model yields suboptimal outcomes for student comprehension and retention.
- c. Students acquire new experiences and insights during cycles I and II, leading to an enhancement in learning completion relative to the pre-cycle.
- d. The use of the Think Pair and Share learning paradigm in cycles I and II enhances students' comprehension of their learning objectives, leading to the attainment of the KKM standard (Zulkarnain & Djamilah, 2016).

2. Students' Learning Outcomes

The research indicates that the student learning results derived from the comparison of Cycle I and Cycle II are as follows.

1. Cycle I

a. Individual Outcome

Number of Students : 25 students

Present at Class : 23 students

Surpassed : 17 students (68%)

Not Surpassed : 8 students (32%)

b. Classical Outcome

The average score of students is 52.08.

2. Cycle II

a. Individual Outcome

Number of Students : 25 students

Present at Class : 23 students

Surpassed : 22 students or 88,00%

Not Surpassed : 3 students or 12,00%

c. Classical Outcome

The average score of students is 65.06.

Discussion of Each Cycle

The Think Pair and Share learning model has demonstrated efficacy in enhancing student learning results, as illustrated in the table above. In the initial cycle, 17 students (68.00% of the total) successfully completed the program, however in the subsequent cycle, the number rose to 22 students (88.00% of the total). The number of students who failed to complete reduced from 8 (32.0%) to 3 (12.00%) in cycle II. The adjustments implemented in Cycle II elevated the class average score from 52.08 to 65.06, representing a substantial improvement over Cycle I. An increase of 12.98 points in the average score was seen compared to Cycle I.

Table 5. Recapitulation of Student Learning Completion

No.	Description	Surpassed		Not Surpassed	
		Total	Percentage	Total	Percentage
1.	Cycle I	17	68%	8	32%
2.	Cycle II	22	88%	3	12%

IV. CONCLUSION

Upon concluding two cycles of learning activities, along with subsequent discussions and analyses, the following findings can be drawn: The Think Pair Share pedagogical method positively impacts the mathematical learning outcomes regarding numbers among fourth-grade pupils at Inpres Nasem Merauke Elementary School. The beneficial impact is evidenced by the enhancement in student learning outcomes across each cycle; in Cycle I, 17 students (68.00%) demonstrated improvement, while in Cycle II, this number rose to 22 students (88.00%). In Cycle I, the number of students who did not complete was 8 (32.00%), which reduced to 3 (12.00%) in Cycle II. The mean student score rose from 52.08 in Cycle I to 65.06 in Cycle II, resulting in an increase of 12.98.

The implementation of the Think Pair and Share learning paradigm positively impacts student creativity, enhances

student engagement in prolonged learning, and mitigates boredom, hence rendering the learning experience more enjoyable.

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